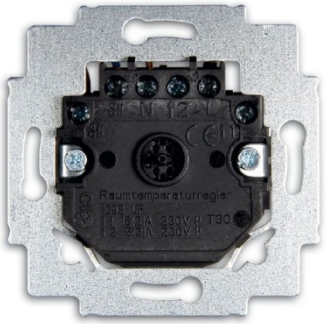
1473-1-8292 | Rev. 01 | 17.12.2012

Operating Instructions
Temperaturregler

Temperature controller
1098 U-500
1098 UF-500



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1 Safety

Warning

Electric voltage!
Risk of death and fire due to electrical voltage of 230 V.
– Work on the 230V supply system may only be performed by authorised electricians!
– Disconnect the mains power supply prior to installation and/or disassembly!

2 Intended use

The device is to be used exclusively with the components that are supplied and licensed as described in chapter "Setup and function".

3 Environment

Consider the protection of the environment!
Used electric and electronic devices must not be disposed of with domestic waste.
– The device contains valuable raw materials which can be recycled. Therefore, dispose of the device at the appropriate collecting depot.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.
The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.
(EU Directive 2002/96/EC WEEE and 2002/95/EC RoHS)
(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006)

4 Setup and function

The room temperature controller is used in heating systems and electric underfloor heating for the timed control of the temperature in closed rooms.

4.1 Features of function and equipment

- With time control
- With change-over contact and thermal feedback
- Easy adjustment using menu and text-based display
- 4 switching times per day can be freely adjusted for each day of the week
- Automatic summer/wintertime switch-over
- Power reserve > 10 hours
- Servo valves of "closed when de-energized“ design are required for the controller.
- Design U with internal sensor
- Design UF with external remote sensor

4.2 Modules

The following modules are used. The device can only be operated with a central cover plate 6435-.... The cover plate is latched onto the control element as a so-called "floating rocker".

1098 U-101
1098 UF-101

6435-...

Fig. 1: Modules

5 Operation

5.1 Hints on operation

In the event of a power failure, the internal clock continues to operate for about 10 hours. After this the time and date have to be reprogrammed. All other data remain saved.

The operating element can be removed from the flush-mounting insert for approximately 20 minutes and adjusted separately.

A total of 4 switching times per day can be set:
– 2 x for comfort mode
- 1 x for standby mode
- 1 x for night mode

If the display is on **--:--** , this can mean the following:
– no time has been set
– the memory is not occupied
– the function is not active

Flashing numbers / values can be changed. If no entry is made, the display switches back to the operating mode after 2 minutes.

5.2 Key assignment

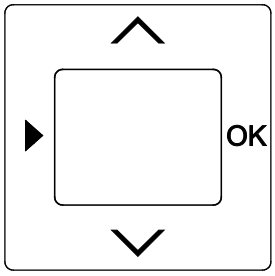


Fig. 2: Button assignment of cover pate

Button	Function	In setting mode	Adjusting values	RESET
▶	Calling up menu level and switching to setting mode. - Keep the button pressed for 2 seconds.	Return to operating mode		Press all buttons of the rocker switch simultaneously for approx. 5 seconds. The temperature controller will be reset to the factory settings.
∧	Raise temperature	Select menu item	Adjust values	
∨	Lower temperature			
OK	Confirmation	Select menu	Accept value	

Note
The set temperature will be adjusted regardless of the time programs. If necessary, the value can be manually changed with the UP button (∧) or DOWN button (∨). This does not affect the values that are set in the time programs.

5.3 Display

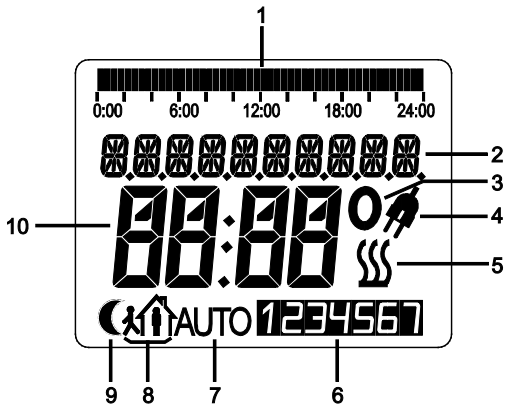
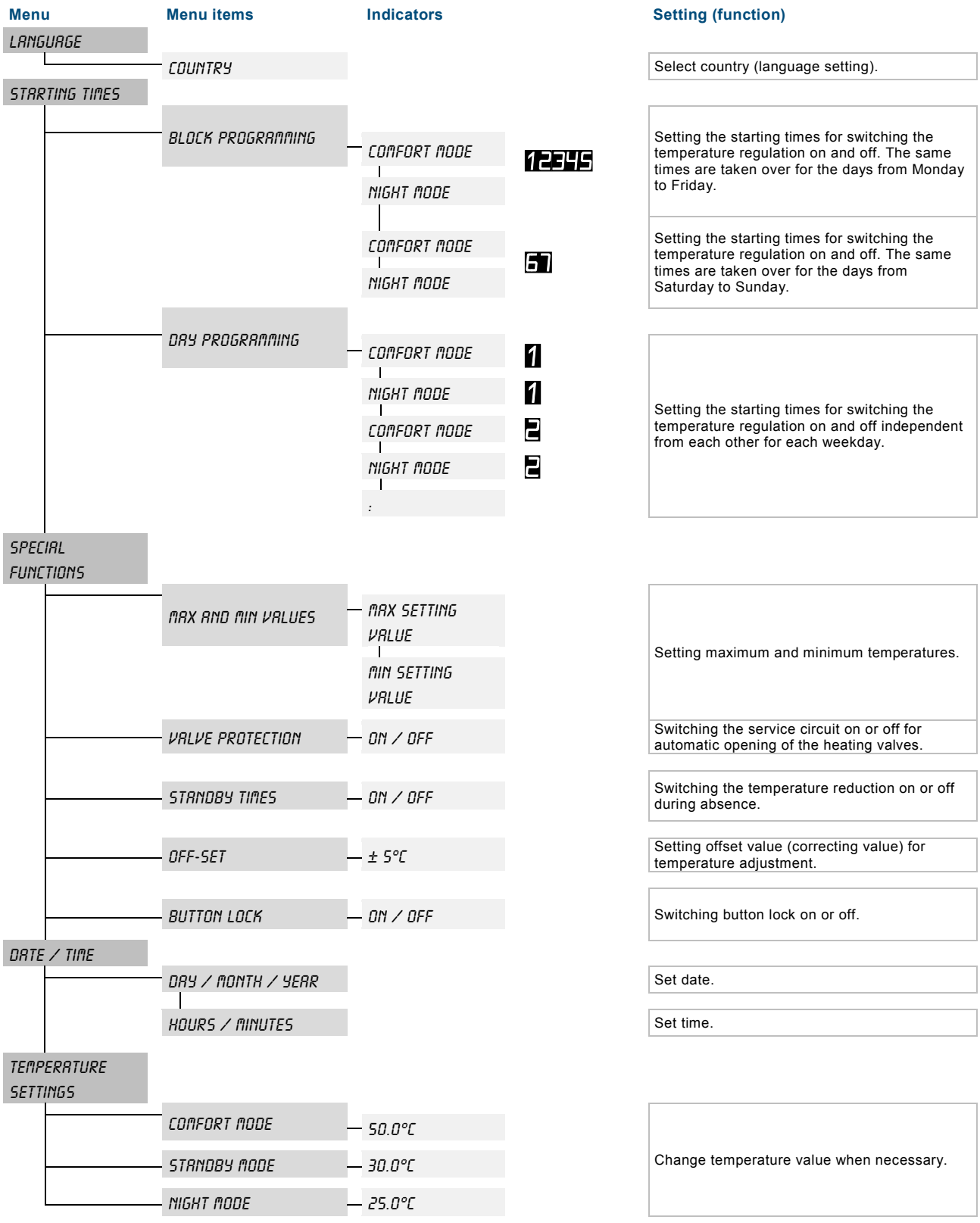


Fig. 3: Symbols

No.	Function
1	Display of programmed daily cycles
2	Info line / time / date
3	Symbol for °C
4	Mains power failure
5	Status display = heating
6	Current weekday
7	“Automatic” operating mode
8	"Comfort / Standby" operating mode
9	"Night" operating mode
10	Temperature / status

Note
If the text is too long for the info line, it will run through the info line.

5.4 Overview of the menu structure



5.5 Adjusting the device

All settings of the device are carried out supported by text-controlled operator prompting. The language, time and date have to be set first during initial commissioning..

Note
Values which need to be changed flash and are displayed in grey in the following illustrated examples.

During initial commissioning or re-commissioning after a reset or reset to factory settings, one of the buttons must be pressed for 5 seconds to release the button lock.

The button lock can also be deactivated. See section 5.8.5.

Commissioning must be carried out anew after a reset. After initial commissioning or after a reset, the device briefly displays the version number.

A detailed description of the individual operating steps for programming is contained in the following sub-sections.

Note
In the event of an incorrect entry, the menu button can be pressed in order to return to the start of the selected menu item or menu level. After a renewed actuation of the menu button, first there is a change to a higher level, up to the display of the operating mode.

5.5.1 Language

The language is set via the selection of the country.

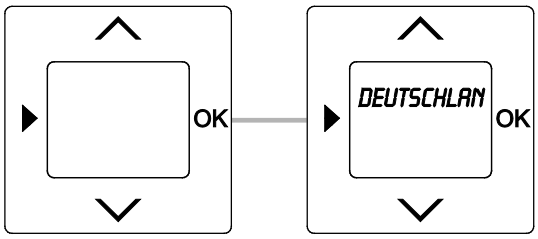


Fig. 4: Country / language selection

Button	Indication	Entry / Comments
∧∨	GERMANY	Selecting languages - Select the country via the arrow buttons.
OK		- Confirm your selection with the OK button. You simultaneously switch to the next menu item. This is followed by setting the year, month, day, hour and minute. See section 5.8.6.

Note
To change the language at a later point in time, see section 5.5.3.

5.5.2 Rest (resetting the device)

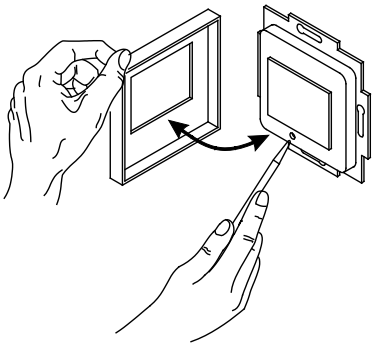


Fig. 5: Reset

1. Remove the cover and press the reset button.
2. Replace the cover.
3. Then, again set the language, the date and the time, see section 5.5.

5.5.3 Factory settings

• Comfort operation:	
Mon – Fri: 07.00 h	23°C
Sat – Sun: 08.00 h	23°C
• Standby mode	
Mon - Sun 09.00 h	19°C
(can be selected if required, special functions menu)	
• Night mode	
Mon - Sun 22.00 h	16°C

5.5.3.1 Reset the device to the factory settings.

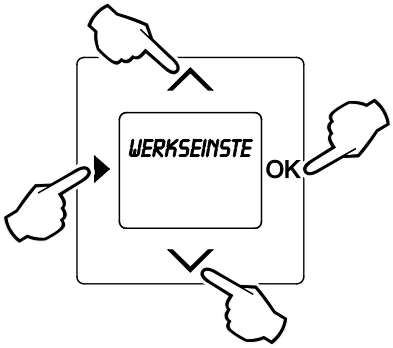
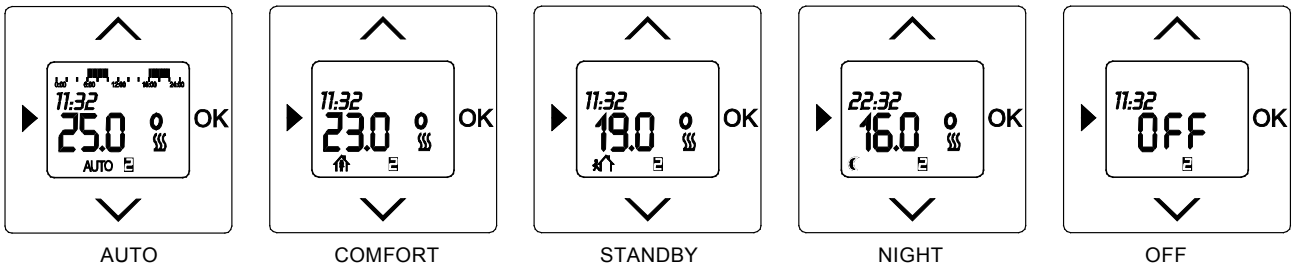


Fig. 6: Factory settings

1. Press all 4 buttons simultaneously, or the entire operating surface for more than 5 seconds.
   For this the device must be in operating mode. The text "Factory settings" will appear in the display.
2. Confirm the enquiry with the OK button.
   The device will be reset to the factory settings.

5.6 Operating modes



AUTO COMFORT STANDBY NIGHT OFF

Fig. 7: Display views of operating modes

Icon	Operation mode
AUTO	AUTO At the programmed times, the system is brought to the programmed set values for comfort, stand-by, and night. *
	COMFORT MODE Temperature when somebody is present *
	STANDBY MODE Temperature when nobody is present This function is not automatically activated at the factory. *
	NIGHT MODE Temperature during the night *
	OFF The control system is switched off. No temperature value is displayed. The display appears when OFF is activated. Manual temperature changes are not possible.

* The temperature can always be changed manually.

- Press the OK button for 2 seconds to change the operating mode.
- All of the temperature values that are displayed are set values.
- Active programs can be recognised by a flashing dot in the temperature display.

5.7 Setting the starting / switching times

5.7.1 General

- STANDBY times can only be set to a point of time that is **later** than the set comfort time.
- Night mode cannot be set after 23.59 h since the starting time (night) will jump to the comfort time previously programmed on the same day.
- BLOCK programming
  So that the switching times need not be entered again for each individual day, the BLOCK programming function is available. This means that the switching times are entered once for block (Mon - Fri) and once more for block (Sat - Sun).
- DAY programming
  Here the switching times for each day can be set independent from each other.

The settings that are available and how the individual menu items are called up is described in the following sub-sections.

5.7.2 BLOCK programming

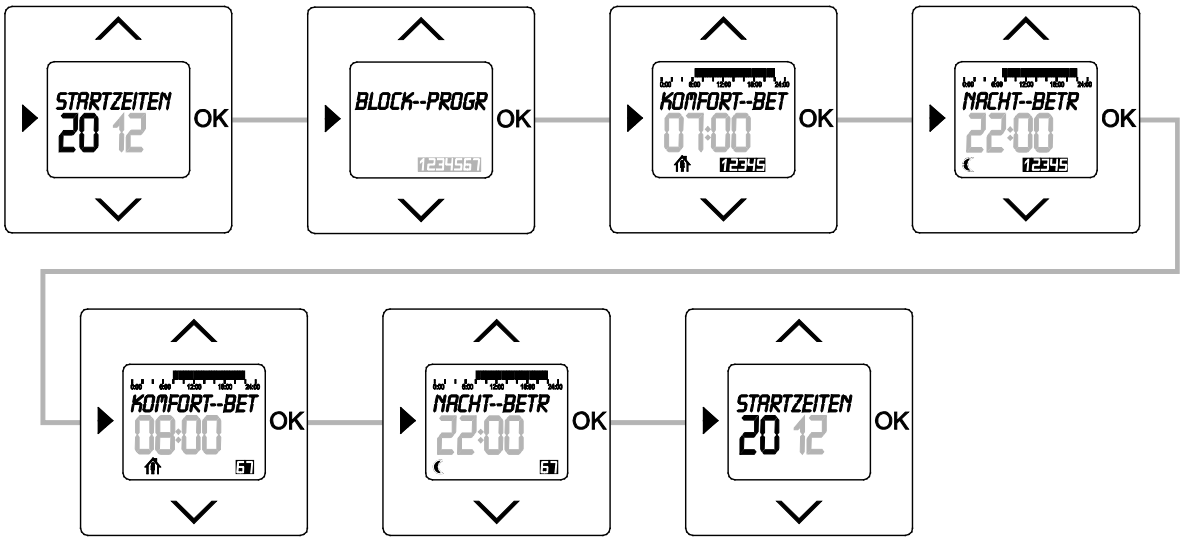


Fig. 8: Menu item – Block

Sequence of operating steps

Button	Indication	Entry / Comments
▶	STARTING TIMES	- Press the menu button for 2 seconds to switch to the setting mode.
OK	BLOCK	- Press the OK button to select menu item "Block programming".
OK	1234567	The weekdays flash. - Press the OK button again.
OK	COMFORT MODE / 07:00	The preset starting time for "Comfort mode" flashes (Mon - Fri).
∧∨	7:30	- Set the desired starting time via the arrow buttons. In this example the starting time has been set at 7:30.
OK	NIGHT MODE / 22:00	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Night mode" (Mon - Fri). The preset starting time flashes.
∧∨	22:30	- Set the desired starting time via the arrow buttons. In this example the starting time has been set at 22:30.
OK	COMFORT MODE / 08:00	- Press the OK button again. You simultaneously switch to the next menu item "Comfort mode" (Sat - Sun). The preset starting time flashes.
∧∨	8:30	- Set the desired switch-on time via the arrow buttons. In this example the switch-on time has been set at 8:30.
OK	NIGHT MODE / 22:00	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Night mode" (Sat - Sun). The preset starting time flashes.
∧∨	22:30	- Set the desired switch-off time via the arrow buttons. In this example the starting time has been set at 22:30.
OK	STARTING TIMES	- Confirm your entry with the "OK" button. The starting times are now set.
▶		- Press the menu button to switch to the operating mode.

5.8 Calling up special functions

The settings of the special functions that are available and how the menu items are called up is described here. A detailed description of the individual functions is contained in the following sub-sections.

5.8.1 MAX and MIN values

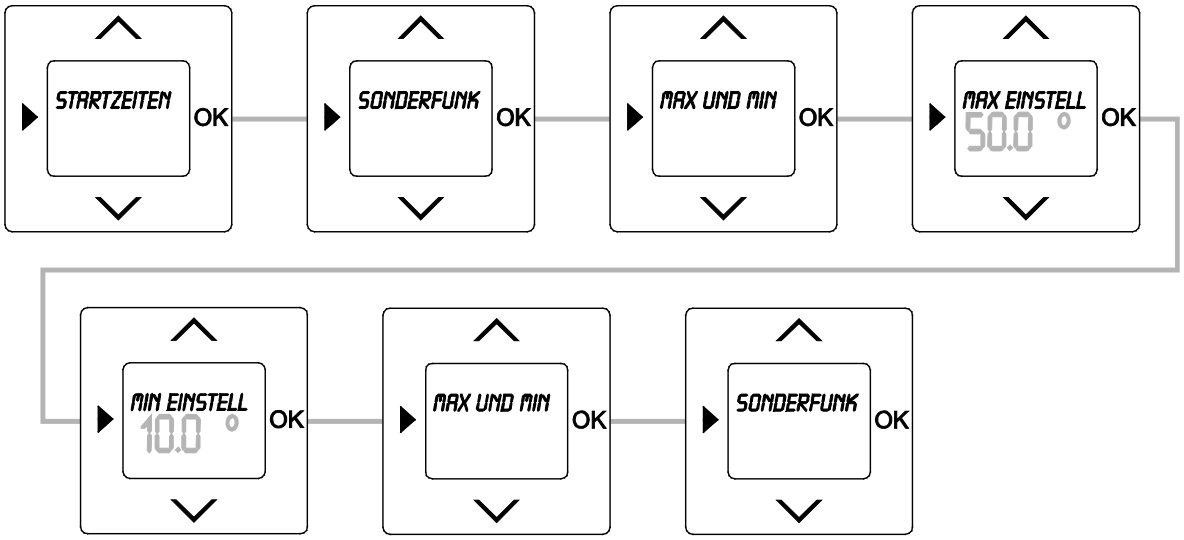


Fig. 9: Menu item – Max and Min values

If required, here the set temperature ranges can be individually limited.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	SPECIAL FUNCTIONS	- Select menu "Special functions" via the arrow buttons.
OK	MAX AND MIN VALUES	- Press the OK button to select menu item "Max and Min values"
OK	MAX SETTING VALUE / 50.0°	- Confirm your entry with the "OK" button. Menu item "Max setting value" is called up. The preset maximum temperature of 50°C flashes.
∧∨	45.0°	- Set the desired temperature via the arrow buttons. The values can be set in steps of 0.5°C. The adjustment range depends on the type of the device:

Type	Value	Adjustment range
1098 U-101	MIN	05.0 - 15.0°C
	MAX	20 - 30.0°C
1098 UF-101	MIN	10.0 – 25.0°C
	MAX	35.0 – 50.0°C

	In this example a temperature of 45°C has been set.
OK	MIN SETTING VALUE / 25.0°
	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Min setting value". The preset minimum temperature of 10°C flashes.
∧∨	20.0°
	- Set the desired temperature via the arrow buttons. In this example a temperature of 20°C has been set.
OK	MAX AND MIN VALUES
	- Confirm your entry with the "OK" button. The maximum and minimum temperature values have been set.
▶	SPECIAL FUNCTIONS
	- Press the menu button to switch to menu level "Special functions".
▶	
	- Press the menu button again to switch to the operating mode.

5.8.2 Valve protection

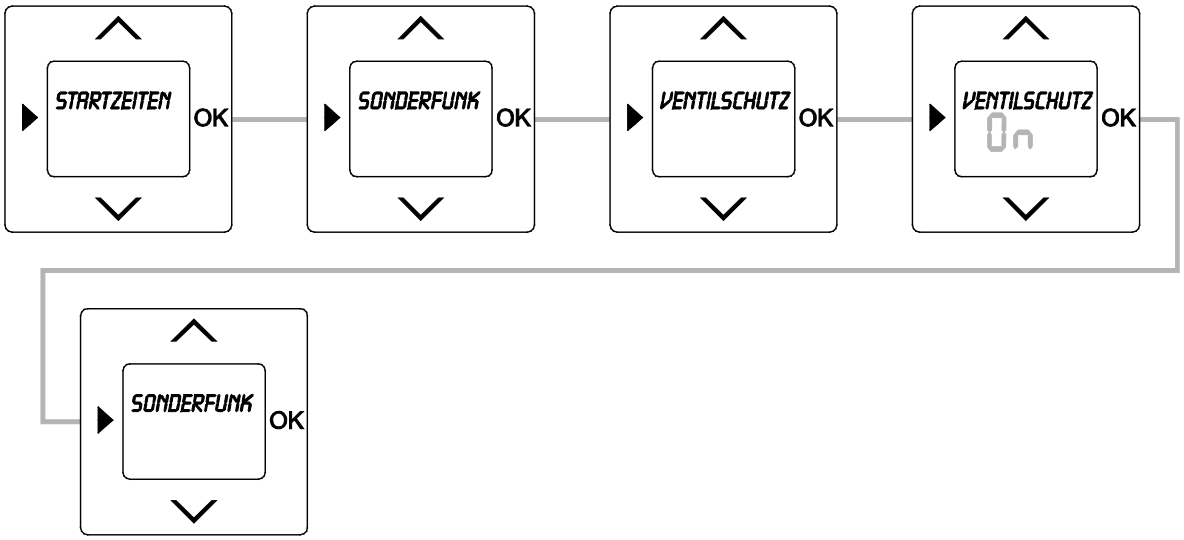


Fig. 10: Menu item – Valve protection

In order to prevent the valve of the heater/circulating pump from getting blocked, it can be programmed to open automatically once a day. When the service circuit is activated the heater valve opens daily at 10 a.m for 5 minutes.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	SPECIAL FUNCTIONS	- Select menu "Special functions" via the arrow buttons.
OK	VALVE PROTECTION	- Press the OK button to select menu item "Valve protection". The default setting flashes.
∧∨	ON / OFF	- Set the service circuit on ON or OFF via the arrow buttons.
OK	ON	- Confirm your entry with the "OK" button. In the example the setting "On" has been selected.
▶	SPECIAL FUNCTIONS	- Press the menu button to switch to menu level "Special functions".
▶		- Press the menu button again to switch to the operating mode.

5.8.3 Standby times

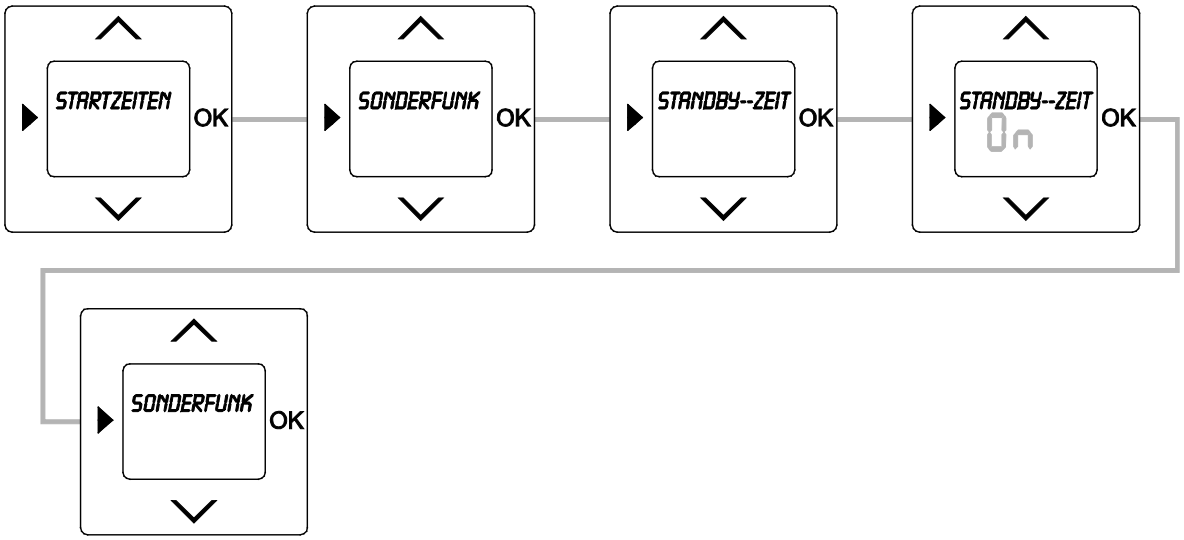


Fig. 11: Menu item – Standby times

Standby mode is not activated at the factory. The activation and adjustment (reduction) of the temperature during absence can be activated or deactivated here.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	SPECIAL FUNCTIONS	- Select menu "Special functions" via the arrow buttons.
OK	STANDBY	- Press the OK button to select menu item "Standby times". The default setting flashes.
∧∨	ON / OFF	- Set the standby times on ON or OFF via the arrow buttons.
OK	ON	- Confirm your entry with the "OK" button. In the example the setting "On" has been selected.
▶	SPECIAL FUNCTIONS	- Press the menu button to switch to menu level "Special functions".
▶		- Press the menu button again to switch to the operating mode.

5.8.4 OFF-Set

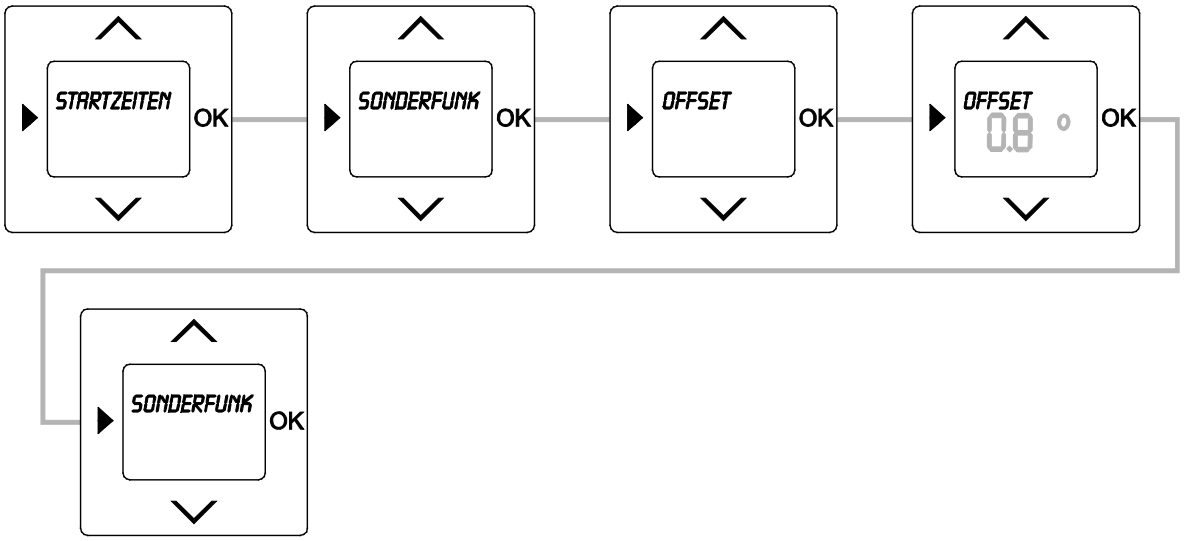


Fig. 12: Menu item OFF-Set

If the room temperature set at the device and the temperature measured on-site do not corresponding, the temperature can be adapted via the OFF-Set value (correcting value) by up to ±5°C.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	SPECIAL FUNCTIONS	- Select menu "Special functions" via the arrow buttons.
OK	OFF-SET	- Press the OK button to select menu item "OFF-Set". The preset value flashes.
∧∨	0.0°	Adjust the temperature Set the temperature variance to the measured temperature on-site via the arrow buttons. The value can be set in steps of 0.1°C.
OK	0.8°	- Confirm your entry with the "OK" button. In this example an OFF-Set value of 0.8°C has been entered.
▶	SPECIAL FUNCTIONS	- Press the menu button to switch to menu level "Special functions".
▶		- Press the menu button again to switch to the operating mode.

5.8.5 Button lock

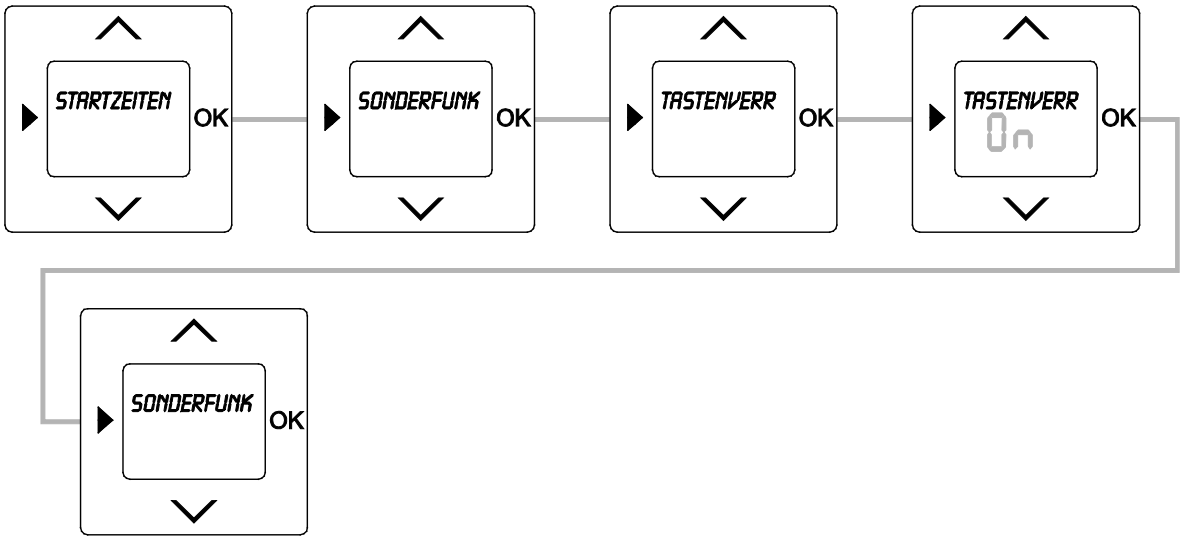


Fig. 13: Menu item – Button lock

The protect the basic settings against being unintentionally changed, the device has a button lock. To release the button lock when it is active, one of the buttons must be pressed for 5 seconds.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	SPECIAL FUNCTIONS	- Select menu "Special functions" via the arrow buttons.
OK	VALVE PROTECTION	- Press the OK button to select menu item "Button lock". The default setting flashes.
∧∨	ON / OFF	- Set the button lock on ON or OFF via the arrow buttons.
OK	ON	- Confirm your entry with the "OK" button. In the example the setting "On" has been selected. The button lock has been activated.
▶	SPECIAL FUNCTIONS	- Press the menu button to switch to menu level "Special functions".
▶		- Press the menu button again to switch to the operating mode.

5.8.6 Date and time

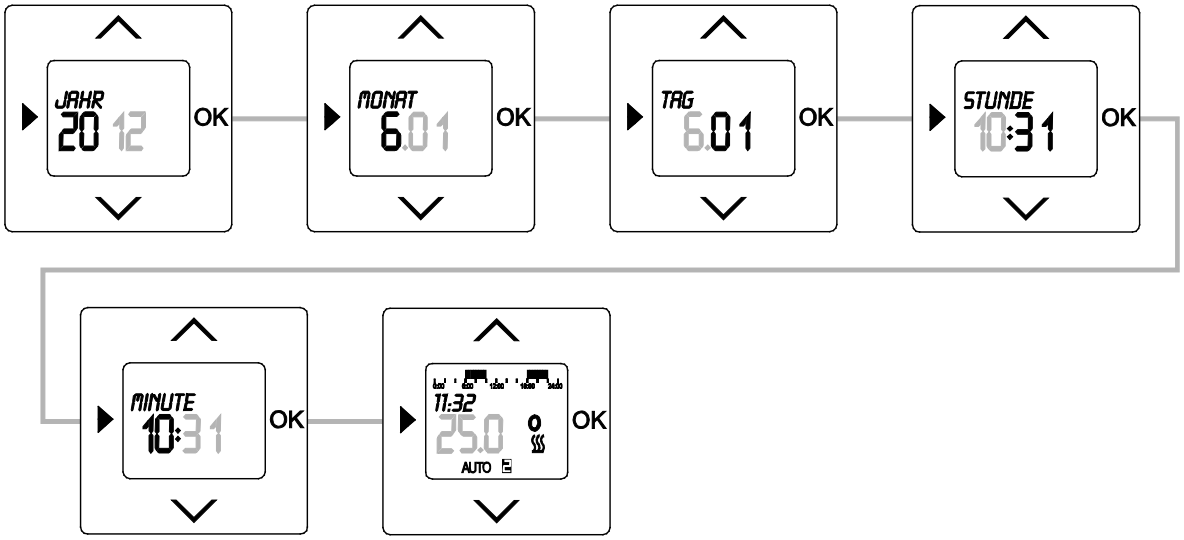


Fig. 14: Date

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	DATE--TIME	- Select menu "Date - Time" via the arrow buttons.
OK	YEAR / --:--	- Confirm your entry with the "OK" button. *During initial commissioning or after a reset to factory settings, and after the selection of the language, menu item "Year" is automatically displayed.* The preset year flashes.
∧∨	2011	- Set the year via the arrow buttons.
OK	MONTH / --:--	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Month". The preset month flashes.
∧∨	6.01	- Set the month via the arrow buttons.
OK	DAY / --:--	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Day". The preset day flashes.
∧∨	6.01	- Set the day via the arrow buttons.
OK	HOUR / --:--	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Hour". The preset hour flashes.
∧∨	10:31	- Set the hour via the arrow buttons.
OK	MINUTE / --:--	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Minute". The preset minute flashes.
∧∨	10:31	- Set the minutes via the arrow buttons.
OK		- Confirm your entry with the "OK" button. The temperature controller changes into operating mode "Auto".

5.8.7 Adjust temperature

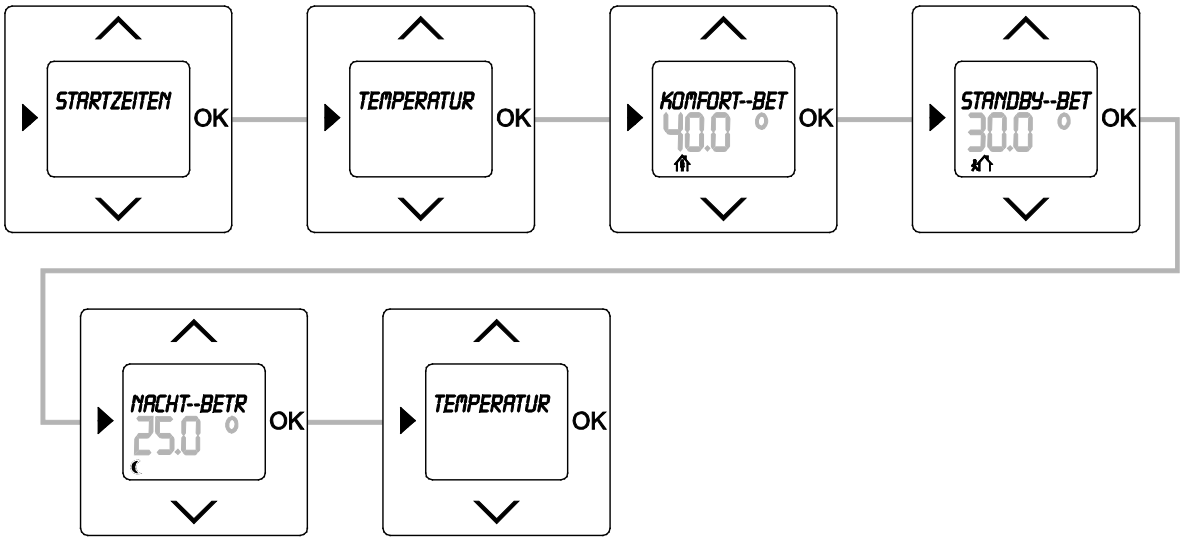


Fig. 15: Menu item – Temperature adjustment

Here, the preset temperature values can be changed manually as required.

Sequence of operating steps

Button	Display	Entry / Comments
▶	STARTING TIMES	- By pressing the menu button for two seconds you switch to the setting mode.
∧∨	TEMPERATURE SETTINGS	- Select menu "Temperature settings" via the arrow buttons.
OK	TEMPERATURE SETTINGS	- Press the OK button to select menu item "Temperature settings".
OK	COMFORT MODE / 40.0°	- Confirm your entry with the "OK" button. The preset temperature for "Comfort mode" flashes.
∧∨	45.0°	- Set the desired temperature via the arrow buttons. In this example a temperature of 45°C has been set.
OK	STANDBY MODE /	*Menu item "Standby mode" is displayed only if menu item "Standby times" has been activated first in menu "Special functions".* - Confirm your entry with the "OK" button. The preset temperature for "Standby mode" flashes.
∧∨	25.0°	- Set the desired temperature via the arrow buttons. In this example a temperature of 25°C has been set.
OK	NIGHT MODE / 25.	- Confirm your entry with the "OK" button. You simultaneously switch to the next menu item "Night mode". The preset temperature for "Night mode" flashes.
∧∨	20.0°	- Set the desired temperature via the arrow buttons. In this example a temperature of 20°C has been set.
OK	STARTING TIMES	- Confirm your entry with the "OK" button. The temperature values have been set. **Effects in "Auto mode":** The changed temperature values remain valid until the next programmed time. The AUTO symbol flashes. **Effects in "Comfort / Standby or Night mode":** There is an adjustment to the changed temperature values. The AUTO time program is not executed. The corresponding symbols are deactivated.
▶		- Press the menu button to switch to the operating mode.

5.9 Display during mains power failure

The illustration on the right shows an example of a display with the mains voltage activated.

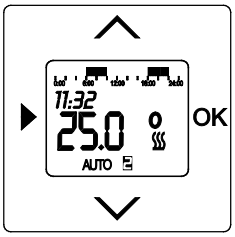


Fig. 16: Display during normal operation

The illustration on the right shows the display during a mains voltage failure or the control element unplugged. Prerequisite, however, is that the temperature controller was charged previously for several hours.

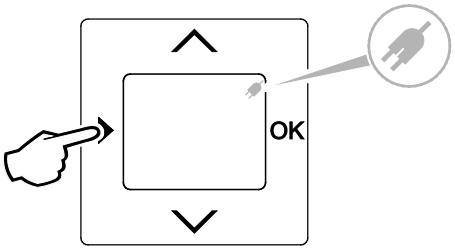


Fig. 17: Display during mains power failure

The flashing plug symbol (see magnification) shows that the mains voltage supply to the temperature controller is deactivated. The time continues to run in the background, but is not displayed to save energy.

If the temperature controller is again supplied by the mains network within a period of 10 hours, the current time will be shown in the display.

Operation of the unplugged control element

If the control element (the temperature controller) was unplugged for programming, the menu level must first be called up with a long press of the button.

Operation is then carried out as normal.

6 Technical data

General			
Nominal voltage		230 V AC ± 10%, 50 Hz	
Nominal power	1098 U-101	10 (4) A	Changeover / normally-open contact for actuators, de-energized closed (connection 1)
		5 (2) A	Changeover / normally-closed contact for actuators, de-energized open (connection 2)
	1098 UF-101	16 (2) A	Changeover / normally-open contact for actuators, de-energized closed (connection 1)
		5 (2) A	Changeover / normally-closed contact for actuators, de-energized open (connection 2)
Changeover contact – Opening		<3 mm µ	
Entry	1098 UF-101	External temperature sensor	
Power reserve		Approx. 10 h at 25°C	
Control range	1098 U-101	5 ...30 °C	
Control range	1098 UF-101	10 ...50 °C	
Memory - Switching times		28	
Summer / winter time		Automatic changeover	
Shortest switching interval		5 minutes	
Ambient temperature		0 ...30 °C	
Protection type		IP 20	
In accordance with:		EN 60730-2-9	

7 Installation and electrical connection

Warning

Electric voltage!
Risk of death due to electrical voltage of 230 V during short-circuit in the low-voltage line.
– Low-voltage and 230 V lines must not be installed together in a flush-mounted socket!

7.1 Requirements for the electrician

Warning

Electric voltage!
Install the device only if you have the necessary electrical engineering knowledge and experience.
- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:
- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect from power;
  2. Secure against being re-connected;
  3. Ensure there is no voltage;
  4. Connect to earth and short-circuit;
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the supply network type (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

7.2 Mounting

Warning

Electric voltage!
Risk of death and fire due to electrical voltage of 230 V.
– Work on the 230V supply system may only be performed by authorised electricians!
– Disconnect the mains power supply prior to installation and/or disassembly!

The flush-mounted insert must only be installed in flush-mounted wall boxes according to DIN 49073-1, Part 1, or suitable surface-mounted housings.

1. Pull the attachment off.

- If the device is already mounted or assembled, pull off the attachment from the flush-mounted insert with the aid of the frame.

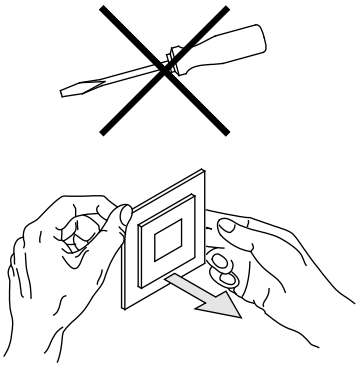


Fig. 18: Wall mounting: pulling off the attachment

– If the state of the device is at the point of delivery, pull off the attachment from the flush-mounted insert with your hands.
– Pull the attachment off only with your hands.
Do not lever parts off with screwdrivers or similar hard objects. This damages the device.
– When pulling off, first the resistance of the plastic clamps must be overcome.

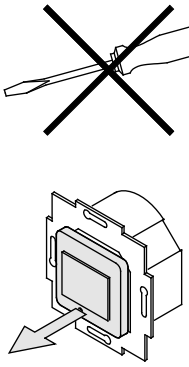


Fig. 19: State of the device at the point of delivery: pulling off the attachment

2. Connect the cables to the flush-mounted insert.
   – For the connection assignment see chapter "Electrical connection" on page 23.

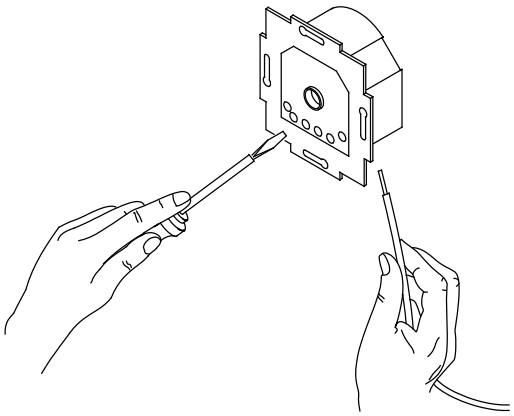


Fig. 20: Connecting the cables

3. Mount the flush-mounted insert.

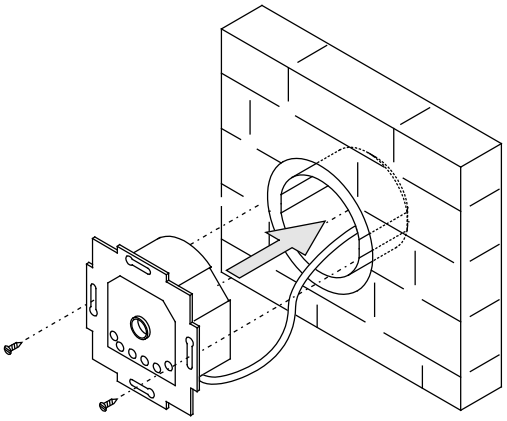


Fig. 21: Mounting the flush-mounted insert.

4. Plug the attachment together with the frame onto the flush-mounted insert.
   – Make sure that the plug-in connection on the rear side does not get jammed.
   – If mounting is difficult, check whether a burr has formed at the lock-in opening of the flush-mounted insert and remove it.

   The device is now mounted.

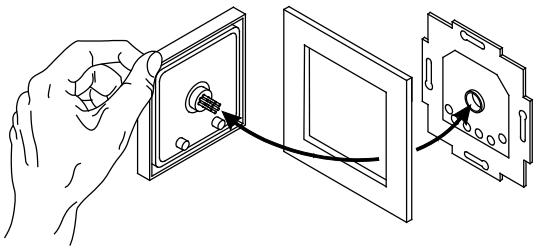
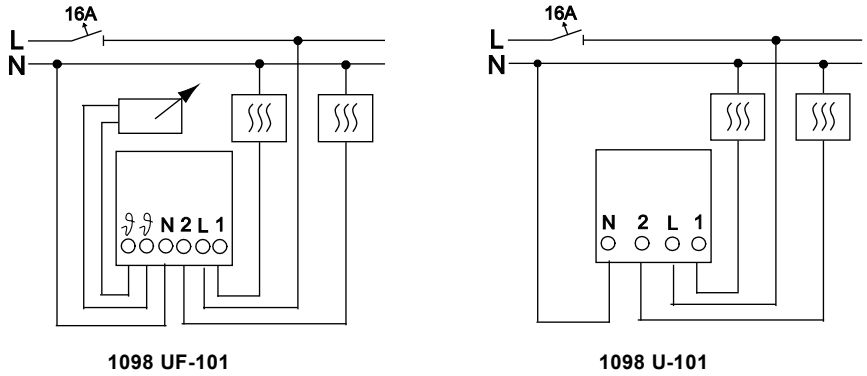


Fig. 22: Plug-on of attachment

7.3 Electrical connection



1098 UF-101 **1098 U-101**

Fig. 23: Circuit diagrams

Terminal designation	Assignment
L	Phase
N	Neutral conductor
1	Output for controlling the heating load
2	Output for controlling the cooling load
ϑ	Remote sensor connections

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